

Exploring Critical Success Factors in E-Learning Implementation

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Index Terms: About four key words or phrases in alphabetical order, separated by commas.

I. INTRODUCTION

The integration of technology in education system has changed the traditional teaching and learning environment to the new learning style (Madina, 2014). The use of e-learning in education system has brought a huge revolution in how information is conveyed in the new generation (Bhuasiri, Xaymounghoun, Zo, Rho, & Ciganek, 2012; Malik, 2010; Odunaik, Olugbara, Sunday O., & Ojo, 2013; Vrana, Zafiroopoulos, & Drogalas, 2006). After the revolution, e-learning could also create an efficient and attractive learning environment compared to the traditional ways (Madina, 2014).

In earlier stage, e-learning was known with various names such as, web-based learning (WBL), web-based instruction (WBI), web-based training (WBT), Internet-based training

(IBT), distributed learning (DL), advanced distributed learning, distance learning (DL), online learning (OL), mobile learning (m-learning), nomadic learning, remote learning and off-site learning (Madina, 2014). Khan (2005) defined e-learning as a student-centred innovation learning. However, Wagner, Hassanein, and Head (2008) and Govindasamy (2002) interpreted that e-learning is considered as a medium used to give instruction via electronic media such as internet, intranet, extranet, satellite television, audio/video tape, interactive TV, and CD-ROM. This statement is in line with Al-Homod and Shafi (2013), e-learning is an education system which used to convey information via IT. In addition, Mbarek and Zaddem (2013) said that e-learning is an instruction of teaching and learning (T&L) which is supported by using information communication technology (ICT) which enables the students to obtain new knowledge and skills at any time and at anywhere by using a variety of digital technology sources together with the relevant teaching materials. The summary of the e-learning definition is shown in Table 1. However, in this paper e-learning is defined as a medium used in teaching and learning sessions supported by the ICT application. It will enable students to obtain new knowledge and skills which will assist and increase the process of interactive teaching and learning among students and teachers.

TABLE 1: E-LEARNING DEFINITION

Authors	Definition
Khan (2005)	E-learning is a student-centred innovation learning.
Govindasamy (2002) and Wagner et al. (2008)	E-learning is considered as a medium to give instructions via electronic media.
Al-Homod & Shafi (2013)	E-learning is an education system which use to convey the information via IT sources and multimedia application.
Mbarek & Zaddem (2013)	E-learning is an instruction of T & L supported by ICT and enables the students to obtain new knowledge and skills at anytime and anywhere by using a variety of digital technology sources.

It can't be denied that the success of e-learning depends on various of important factors that will bring success to an inclusive e-learning project. Therefore, the Critical Success Factors (CSFs) are the foundation of success behind the implementation of e-learning. Frimpon (2012) suggests that the educational organizations should handle the CSFs properly to achieve their goals

Revised Manuscript Received on September 22, 2019.

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in the implementation of e-learning. In view of this, the purpose of this research is to discover the effects of CSFs in e-learning implementation.

II. LITERATURE REVIEW

Based on statistic released by UNESCO. (2009), about 455 million people around the world received online education and training in 2008. In addition, more than 70 percent of universities in the United States offer e-learning education and 6.1 million students enrolled in a least one online course via in 2010 (Musa & Othman, 2012). This represents the 31 percent of univeristy students in the United States (Zhang & Cheng, 2012). The same scenario is occuring in Malaysia, where nearly 40 percent of courses in Malaysian universities are offering e-learning based courses with a student enrollment number of about 1.2 million (Helmi, 2002). Furthermore, many educational institutions in Malaysia are starting to combine traditional courses with e-learning innovations to save cost (Helmi, 2002). On top of that, the Ministry of Education Malaysia has invested nearly RM6 billion from 1999 to 2010 to integrate ICT into education through various ICT programs in schools (Ministry of Education Malaysia, 2012).

On the other hand, many e-learning projects have been abandoned and failed in the process of achieving their objectives (Frimpon, 2012; Mosakhani & Jamporzme, 2010). For instance, the UK e-University, NYU Online, Scottish Knowledge, University 21 and Global University Alliance (GUA) failed during the process of implementing e-learning (Garrett, 2004; Oliver, Herrington, & Reeves, 2005; Oppenheimer, 2003; Romiszowski & Sikorski, 2005). Surprisingly, in Malaysia only one third of teachers are using ICT in teaching and learning (T&L) sessions and most of them only use Power Point presentations as their ICT influenced teaching tool (UNESCO, 2012). In addition, less than 80 percent of teachers are using ICT in a period of less than one hour per week in their teaching sessions (Ministry of Education Malaysia, 2012). Meanwhile, Malaysian Auditor General's report in 2013 revealed that the usage of Frog VLE application (another platform of e-learning in Malaysia) by teachers and students are very low, which was less than 4.69 percent (Ministry of Finance Malaysia, 2013; UNESCO, 2012). In view of this a deep understanding of CSFs of e-learning system will assist an organization to manage its funds in an efficient manner to ensure an successful e-learning implementation (Levy (2006).

CSFs are the limited number of factors which ensure the successful performance of an individual or organisation (Rockhart, 1979). According to Freund (1988), CSFs is defined as things that must be done in order for a company to be successful. Many researches have been conducted studies on e-learning but only some of the researches are significant to CSFs (Akhavan, Jafari, & Fathian, 2006). Frimpon (2012) considered CSFs as a variable which became a base for a successful implementation of e-learning and companies that conduct a good CSFs will be almost definitely be successful.

III. METHODOLOGY

The objective introduced in this paper is to identify the CSFs of success e-learning implementation by conducted literature analysis as per shown in Figure 1. The process of reviewing articles started with shortlisting previous studies based on the keywords, "Critical Success Factors for E-Learning". Each paper must be published in a peer-reviewed and/ archival journal. Since there is a large number of papers, only articles that discuss e-learning at "university" and / or "educational institutions" are taken into consideration for analysis. Finally, the articles with the keywords "Critical Success Factors" and/or "affecting factors" appeared in the title and / or abstract are also selected in this study. Out of 133 searching papers only 100 papers were selected for reviewing. The selected papers were reselected by reading the abstract of the papers. At the end of this pross only 44 papers were selected (Appendix 1). The list of 44 selected papers along with the number of papers appeared in journal and conferences can be found in Appendix 2.

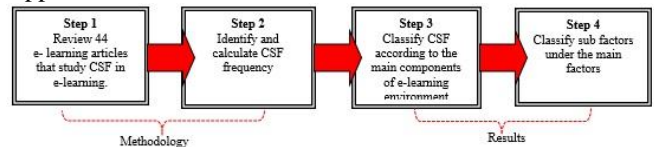


Fig 1. Flow Charts of Literature Review

IV. RESULTS

Based on the reviewed articles, found that many researchers have identified important factors to implement successful e-learning. For instant, H. S. Selim (2007) has that identified learner, instructor, information technology and organization’s support was listed to achieve successful e-learning implementation. Apart from that, Frimpon (2012), has highlighted seventeen success factors which influence the use of e-learning and partitioned into four natural roles as follows: student, Instructor, Technology, and Institution. In addition, Sun, Tasi, Finger, Chen, and Yeh (2008) and Malik (2010) studies were similar to Selim’s (2007) with an additional focus on technical aspects of e-learning. On the same token, Mosakhani and Jamporzme (2010) have revealed that, student’s and teacher’s characteristics, information technology quality, content quality, learning environment and the institution’s support as a CSFs for e-learning. Most of these studies have affirmed that human aspects of students and faculty members are the main critical factors behind the success of e-learning.

Previous studies have investigated the importance of CSFs in the application of e-learning. Alhomod and Shafi (2013); Chokri (2012); Presley and Presley (2009); Taha (2013) classified student’s characteristics and the use of a variety of teaching integration technology are the main factors of successful e-learning implementation. Al-Fadhli (2008) synthesized that the teacher’s dimension is a crucial factor which significantly influences the student’s satisfaction in e-learning environment (Chen., Liao., & Chen., 2010; Jan & Contreras, 2011; Musa & Othman, 2012; Owens & Price, 2010; Sun et al., 2008; Wang & Wang, 2009).



Moreover, Pituch and Lee (2006) have identified that the effectiveness of technology plays an important role in influencing the user's acceptance of e-learning. This study is in line with Abbad, Morris, and De Nahlik (2009); Abu Sneineh and Zairi (2010); Al-Fadhli (2011); Masoumi (2006); Musa and Othman (2012); H. M. Selim (2007); Volery and Lord (2000), which shows that technology plays a significant role in the success of e-learning implementation. On the other hand, the institution's support were classified as a vital factor which enhances the user's usage, satisfaction and acceptance of e-learning (Abdel-Wahab, 2008; Ahmed, 2010; Broadley, 2007; Goi & Ng, 2009; Masoumi, 2006; Mosakhani & Jamporzmay, 2010; H. M. Selim, 2007).

Content quality has positive influence on the users' satisfaction of e-learning (Al- Ammary & Sharifa, 2008; Hassanzadeh, Kanaani, & Elahi, 2012; Owens & Price, 2010; Shee & Wang, 2008; Sun et al., 2008). Additionally, Abdel-Wahab (2008), and Al- Ammary and Sharifa (2008) discussed that attitude has a positive relationship with perceived usefulness. User friendly interface is also one of the essential factors to encourage a positive feedback on the implementation of e-learning (Abdel-Wahab, 2008; Al- Ammary & Sharifa, 2008; Chen & Tseng, 2012; Johnson, Hornik, & Salas, 2008; Presley & Presley, 2009; Wang & Wang, 2009). Some of the previous studies showed that interactive collaboration is one of the main factors which determine the acceptance of e-learning (Goi & Ng, 2009; Johnson et al., 2008; Mosakhani & Jamporzmay, 2010; Musa & Othman, 2012; H. M. Selim, 2007). Social presence, subjective norms, e-learning environment and knowledge management are also considered as important factors in influencing the acceptance in the implementation of e-learning. The break down of the CSFs are as follows;

A. Teacher's Characteristics

Some researchers have revealed that teachers play a vital role in ensuring a successful implementation of e-learning (Ahmed, 2010; Alhomod & Shafi, 2013; Bhuasiri et al., 2012; FitzPatrick, 2012; Hassanzadeh et al., 2012; Nurul Islam, Martin Beer, & Slack, 2015). This is compatible with Ali, Ramay, and Shahzad (2011), who stated that in an e-learning environment, the teachers are required to acquire a new set of skills that are relevant and related to the latest technology available to enhance their effectiveness in the teaching and learning process.

Chen. et al. (2010) who investigated the CSFs in e-learning among 46 adult students from National Open University, Taiwan reported that teacher's attitude such as friendliness and enthusiasm are the crucial factors which are able to influence students to have trust towards the e-learning project. Results from the studies conducted by Volery and Lord (2000), Govindasamy (2002) and Sun et al. (2008) also warrant evidences indicating that teacher's attitude and teaching styles play a vital role in efficient teaching and learning process. Moreover, in e-learning environment, student's acceptance and satisfaction are strongly dependent on teaching style and teacher-student interactions during teaching and learning sessions (Ali et al., 2011; Bhuasiri et al., 2012; FitzPatrick, 2012; McPherson & Nunes, 2008; H. M. Selim, 2007; Volery & Lord, 2000). Besides that,

teacher's efficacy, readiness in negotiation and giving effective feedback on students' inquiry are also ensuring e-learning's success (Bhuasiri et al., 2012; Liaw, Huang, & Chen, 2007; Wang & Wang, 2009). The above findings were consistent with studies conducted by Malik (2010), Mosakhani and Jamporzmay (2010), Al-Fadhli (2011), Jan and Contreras (2011) and Fageeh (2011) on the effects of teacher characteristics in e-learning success. To sum up, many researchers who examined and investigated this topic have agreed and conclude that teacher's characteristics are a significant contributor to e-learning success. It should be highly considered and broadly discussed during the development of implementing e-learning to ensure its success and effectiveness.

B. Student's Characteristics

Vrana et al. (2006) and Ibrahim, Rwegasira, and Taher (2007) defined e-learning as an innovation of technology which provides an effective learning through meaningful interactions and communication between students and teachers. In line with this, Malik (2010), Fageeh (2011), Zewayed, Maynard, and Murray (2011), Frimpon (2012), Alhomod and Shafi (2013), Recep Cakir and Solak (2014), Abdullah and Toycan (2018) have conducted several studies to examine the influence of student's characteristics in e-learning implementation and disclosed that student's role is one of the CSFs in e-learning implementation. Student's positive attitude towards e-learning will enhance their satisfaction and increase the level of e-learning acceptance (Abbad et al., 2009; Liaw et al., 2007; Malik, 2010; Mosakhani & Jamporzmay, 2010; Presley & Presley, 2009; H. S. Selim, 2007; Sun et al., 2008). Abdel-Wahab (2008) and Presley and Presley (2009) agreed that student's attitude would contribute significantly to the success of the implementation on e-learning. Mosakhani and Jamporzmay (2010) and Chen and Tseng (2012) said that motivation controlled factor is also one of the vital factors for better e-learning implementation.

A survey conducted by Teo, Luan, Thammetar, and Chattiwat (2011) among 377 students at three public universities in Thailand revealed that students who had more confidence in using computers showed a higher level of e-learning acceptance. This finding is in line with Chen. et al. (2010), Abbad et al. (2009). The resulted from the studies conducted Mosakhani and Jamporzmay (2010), Al-Fadhli (2011), Frimpon (2012), Chokri (2012), Musa and Othman (2012) and Nurul Islam et al. (2015) also confirmed that computer efficacy and knowledge of using computer can essentially affect student's satisfaction in e-learning environment. Lack of computer knowledge will dampen their online experience and will lead them to not get most of the benefits of e-learning (H. M. Selim, 2007). Other than that, cultural and social norms are also equally important in practising e-learning (Al-Fadhli, 2011). Countries like Saudi Arabia restricting female student getting involved freely in online (Al-Fadhli, 2011). This caused the female students to have less confidence in expressing their ideas as male students in e-learning environment (Al-Fadhli,

2011). In view of this, both cultural and social norms factors must take into consideration during the process of implementing e-learning.

C. Information Technology Infrastructure

Broadley (2007), H. M. Selim (2007), Sun et al. (2008), Wang and Wang (2009), Goi and Ng (2009), stated that information technology infrastructure is proven as a key factor to determine the success of e-learning implementation. This finding is supported by studies conducted by Ahmed (2010), Abu Sneineh and Zairi (2010), Mosakhani and Jamporzmezy (2010), Owens and Price (2010), Al-Fadhli (2011), Bhuasiri et al. (2012), FitzPatrick (2012), Abdullah and Toycan (2018), who identified that, good accessibility and connectivity towards computers and internet are the common elements that influence teachers and students in utilizing ICT resources in teaching and learning sessions. Furthermore, the availability and reliability of information technology infrastructure are able to increase student's satisfaction on e-learning environment (Malik, 2010). In view of this, both availability and reliability of information technology infrastructure must be considered as vital factors in achieving successful e-learning implementation (Abu Sneineh & Zairi, 2010; Al-Fadhli, 2011; Malik, 2010; Pituch & Lee, 2006; H. M. Selim, 2007; Sun et al., 2008). This opinion is in line with a study by Owens and Price (2010) who stated that the technical variables towards perceived usefulness can predict the student's acceptance on e-learning system. In short, all technological infrastructure barriers must rectify to ensure successful e-learning (Abdullah & Toycan, 2018).

D. Design and content

Several researchers have argued that beside teacher's characteristics, student's characteristics, and IT infrastructure, the design and content of the e-learning are also a crucial factor in implementing successful e-learning (Alhomod & Shafi, 2013; Chokri, 2012; Fageeh, 2011; FitzPatrick, 2012; Fuad, Trayek, & . 2013; Jan & Contreras, 2011; Mosakhani & Jamporzmezy, 2010; Presley & Presley, 2009; H. M. Selim, 2007; Sun et al., 2008). Therefore, the quality of design and content are important factors influencing teacher's and student's satisfaction in e-learning environment (Hassanzadeh et al., 2012). System's qualities refer to the stability, security, reliability, speed of response, ease of use, and user-friendliness. Zewayad et al. (2011) proposed that, perceived ease of use of technology determines the student's intention of using e-learning systems it does not require high computer skills and efficiency. Same goes to the content and the delivery process, they should be designed properly because an appropriate assistance is needed to assist students in using technology infrastructure which can increase their confidence in e-learning environment (Sun et al., 2008). Wang and Wang (2009) who conducted a survey among 268 university instructors agreed to this statement and discovered that perceived ease of use can increase perceived usefulness. These findings were consistent with several studies which revealed that perceived ease to use and perceived usefulness of e-learning system will motivate the teachers and students to continue using the system (Alhomod & Shafi, 2013; Chokri,

2012; Fageeh, 2011; FitzPatrick, 2012; Fuad et al., 2013; Jan & Contreras, 2011; Mosakhani & Jamporzmezy, 2010). In view of this both perceived ease of use and perceived usefulness are essential factors to determine teacher's and student's attitudes toward using e-learning system (Abdullah & Toycan, 2018; Bhuasiri et al., 2012; Chen & Tseng, 2012; Fuad et al., 2013; Jan & Contreras, 2011; Owens & Price, 2010). This is in line with a study by Friedrich (2010) who pointed out that perceived usefulness is a major predictor of student's acceptance towards e-learning.

E. Organizational Characteristics

Organization plays a vital role to ensuring success in e-learning environment (Al-Homod & Shafi, 2013; Frimpon, 2012). Organization's commitments such as management support in the technical aspect, human resources, training programs for users and ICT technicians are the most important aspects which play crucial roles in the success of e-learning implementation (Al-Homod & Shafi, 2013; FitzPatrick, 2012). Furthermore, sufficient e-learning initiatives and availability of information on website must take into consideration (Abu Sneineh & Zairi, 2010; Ahmed, 2010; Al-Homod & Shafi, 2013; Frimpon, 2012; Mosakhani & Jamporzmezy, 2010). Moreover, the lack of technical advice and support from organization will lead to the failure of the e-learning projects (Ahmed, 2010; Al-Homod & Shafi, 2013). In another words, organization's supports in both human and non human resources are essential for e-learning's success (Abu Sneineh & Zairi, 2010; Ahmed, 2010; Bhuasiri et al., 2012; Hassanzadeh et al., 2012; Mosakhani & Jamporzmezy, 2010; Nurul Islam et al., 2015). Organization's support is not only limited to technical assistance, but it covers all type of supports in order to make sure that the e-learning project becomes successful.

V. FINDINGS

Based on the literature analysis, five main factors and eighteen sub-factors were identified as a CSFs for successful e-learning implementation. The CSFs are teacher's characteristics (teacher's attitude, teacher's computing technical skills, interaction among teaches-students, teaching style, knowledge in e-learning content development and self-efficacy), student's characteristics (attitude, computer competency, interaction, self-efficacy, motivation and cultural and social norms), information technology infrastructure (internet accessibility, reliability and availability), design and content (perceived ease of use and perceived usefulness) and organization characteristics (training and support). A proposed conceptual framework was designed based on these CSFs as per shown in Figure 2.

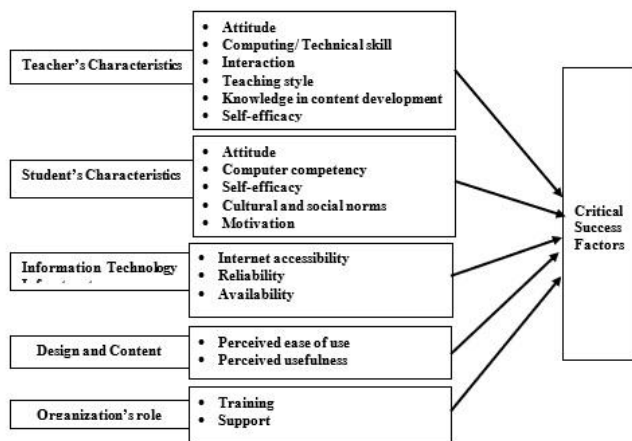


Fig 2. A Proposed Conceptual Framework on CSFs in e-Learning Implementation

VI. CONCLUSION

In last two-decade e-learning has become a more popular way of study among students in the world. This trend can also be seen in higher education institution and schools where the students utilize the e-learning system to gain new knowledge and skills in their respective field of study. Although various initiatives have been taken to ensure the success of e-learning, but there are still several e-learning programs that do not meet their goals. Therefore, identifying CSFs is a big step towards determining the correct direction of a successful implementation of e-learning. It can be concluded that, CSFs is a variable and its characteristics should be considered carefully during the planning phase of e-learning, in order for the e-learning project to be implemented steadily. Hence, these CSFs must be verified, controlled and measured to determine the success of the entire e-learning system.

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APPENDIX 1

SOURCES OF PUBLICATION AND CITATION NUMBER

Publisher	Reference	Year	Cites*
Center for Promoting Ideas, USA	Frimpon,	2012	22
	Al-Fadhli,	2011	14
	Sun et al.	2008	183
	Jan, A. U., & Contreras, V.	2011	97
	Wang, W. T., & Wang, C. C.	2009	258
	Pituch & Lee	2006	755
	Abu Sneineh & Zairi,	2010	14
	Shee dan Wang,	2008	346
	Hassanzadeh, A., Kanaani, F., & Elahi, S.	2012	151
	Johnson et al.,	2008	388
Elsevier Ltd.	Chen dan Tseng,	2012	132
	Liaw, S. S., Huang, H. M., & Chen, G. D.	2007	651
	Govindasamy, T.	2002	890
	Bhuasiri, W. et al.	2012	378
	Selim H.M.	2007	880
	Selim	2007	62
	Malik,	2010	19
	Presley dan Presley,	2009	28
	Chokri,	2012	13
	Al-Fadhli	2008	23
Inderscience Publishers	Wang dan Wang,	2009	258
	Friedrich and Horn,	2010	25
Springer			
European Journals Inc			
SAGE Publications Inc.			



Emerald Group Publishing Ltd.	Owens dan Price, Volery and Lord, Musa, M. A., & Othman, M. S.	2010 2000 2012	35 875 18	Technology Education European Scientific Journal Evaluation and Program Planning	1 1 1
Researchgate	Broadley	2007	11	Expert Systems with Applications	1
Wiley	Al-Ammari, Jaflah, and Sharifa Hamad.	2008	25	International Encyclopedia of Education	1
Wiley	Abdel-Wahab, Ahmed,	2008 2010	76 129	International Journal of Advances in Engineering & Technology International journal of educational management	1 1
curtin.edu	Goi dan Ng,	2009	89	International Journal of Human-Computer Studies	1
ascilite.org.au	Teo et al.,	2011	29	International Journal of Instructional Media.	1
The JALT CALL SIG	Fageeh	2011	19	International Journal of Sustainable Development	1
	Ali, A., Ramay, M. I., & Shahzad, M.	2011	81	International Journal of Teaching and Learning in Higher Education	1
ERIC	FitzPatrick (2012)	2012	16	International Journal of Technology Marketing	1
	Sami Alhomod & Mohd Mudasir Shafi	2013	33	International Review of Research in Open and Distance Learning	1
	Recep Cakir & Ekrem Solak	2014	13	Internet and Higher Education	1
Blackwell Publishing Inc.	Abbad et al., McPherson, M. A., & Nunes, J. M.	2009 2008	185 101	Journal of Computer Assisted Learning, Journal of computing in higher education	1 1
DergiPark	Fuad A. A. Trayek & Sharifah Sariah Syed Hassan	2013	6	Journal of Education and Training Studies	1
Moment Publications	Mohammed Simko Abdullah & Mehmet Toycan	2018	1	The JALT CALL Journal	1
RedFame	Nurul Islam, Martin Beer, Frances Slack	2015	22		
Association for the Advancement of Computing in Education (AACE)	Zewayed et al.,	2011	3		
ieeexplore	Mosakhani & Jamporzmay Farn-Shing Chen, Chin-Wen Liao and Tsai-Hsiu Chen	2010 2009	33 5		

NUMBER OF PAPERS IN EACH CONFERENCE

Conference	No of papers
IEEE 2010 International Conference on Educational and Information Technology	1
International Education Research Conference - AARE 2007	1
2nd International Conference and Exhibition for Zain E-learning Center (2008)	1
US-China Education Review A 9	1
2009 International Conference on Education Technology and Training (ETT 2009)	1
E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education (2011)	1

APPENDIX 2

NUMBER OF PAPERS IN EACH JOURNAL

Journal Name	Number of papers
Computer and Education	7
Turkish Online Journal of Distance Education	5
Journal Educational Computing Research	2
American International Journal of Contemporary Research	1
Australasian Journal of Educational Technology	1
Computers in Human Behavior	1
Decision Sciences Journal of Innovative Education	1
Education and Training	1
E-Learning and Digital Media	1
EURASIA Journal of Mathematics, Science and	1

